# AMAI

611 Broadway Suite 907G

New York, New York 10012

## Geologic Boring Log

**Watery Oil Separator SWMU 43**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 43-03 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/26/96 | 6/26/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SP | 24 | 3-6-7-8 | 1 | **0-2 ft.** Sand. Poorly sorted, loose, slightly moist, light brown (7.5YR6/3) to light yellowish brown (10YR6/4). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. |
| 1 | | | | | |
| | **Sample collected** | | | | Full analysis and Immunoassay samples collected. |
| 2 | SP | 18 | 4 | 0 | Immunoassay sample collected. |
| | | | 5 | | light yellowish brown (10YR6/4). Sand composed of quartz, mica, pyrite, shell |
| 3 | **Sample collected** | | 6 | | and lithic fragments varying in size from fine to coarse. |
| | SP | 18 | 4-7-9 | 0 | Full analysis, physiochemical and Immunoassay samples collected. |
| 4 | | | | | **3.5-5 ft.** Sand. Poorly sorted, loose, slightly moist, light brown (7.5YR6/3) to Immunoassay sample collected. |
| 5 | SP | 12 | 5-6-5 | 0 | and lithic fragments varying in size from fine to coarse. |
| | | | | | **5-6.5 ft.** Sand. Poorly sorted, loose, slightly moist to wet, dark grey (Gley 1 |
| 6 | | ▼ | | | brown (10YR6/4). Sand composed of quartz, mica, pyrite, shell and lithic |
| | SP | 12 | 4-5-6 | 0 | fragments varying in size from fine to coarse. |
| 7 | **Sample collected** | | | | **6.5-8 ft.** Sand to silty sand. Poorly sorted, loose, moist to saturated, dark brown (7.5YR3/3) to black (Gley 1, 2.5/N). Sand composed of quartz, mica, |
| 8 | | | | | pyrite, shell and lithic fragments varying in size from fine to coarse. |
| | | | | | Full analysis, physiochemical and Immunoassay samples collected. |
| | | | | | Boring terminated. |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System

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## Geologic Boring Log

**Watery Oil Separator SWMU 43**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 43-04 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/26/96 | 6/26/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM, SP | 18 | 10-9 | 1 | **0-2 ft.** Sandy silt to silty sand to sand. Poorly sorted, loose to soft, slightly moist, very dark brown (10YR2/2) to dark gray (2.5Y4/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Hydrocarbon odor. |
| | Sample Collected | | 11-10 | | |
| 1 | | | | | |
| | Sample Collected | | | | |
| 2 | SM | 12 | 6-6-9 | 2 | Immunoassay sample collected. |
| | | | | | **2-3.5 ft.** Sand. Poorly sorted, loose to soft, slightly moist, dark gray (2.5Y4/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. |
| 3 | Sample Collected | | | | |
| | SM | 18 | 9-9-11 | 0 | Immunoassay sample collected. |
| 4 | | | | | |
| 5 | SP | 10 | 5-7-5 | 0 | **5-6.5 ft.** Gravelly sand. Poorly sorted, loose, slightly moist to wet, dark gray (2.5Y4/1). Sand composed of quartz, mica, pyrite, shell, coral and lithic fragments varying in size from fine to coarse. |
| 6 | | ▼ | | | |
| | SM | 18 | 3-3-4 | 0 | **6.5-8 ft.** Sand to silty sand. Poorly sorted, loose, saturated, dark gray (2.5Y4/1). Sand composed of quartz, mica, pyrite, shell, and lithic fragments varying in size from fine to medium grained. Roots observed. |
| 7 | | | | | |
| 8 | | | | | Boring terminated |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4 8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System

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611 Broadway Suite 907 G
New York, New York 10012

## Geologic Boring Log

**Watery Oil Separator SWMU 43**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| WOS-3 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/8/96 | 8/8/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 24" | 5-6-6-7 | 0.0 | **0-2 ft** Top of spoon (17") fine sand and silt, organic soil layer, some rock fragments<br>Bottom of spoon (7") Med to fine sand bands of gray silt, no rock fragments |
| 1 | | | | | or large gravel, no coarse sand, no visible contamination, Dry,<br>Hue 10 YR 6/2 light brownish gray. |
| 2 | SM | 24" | 13-14<br>15-16 | 0.0 | **2-4 ft** Same as above, no visible contamination, moist at bottom of spoon<br>Abundant pyrite and mica, Hue 10 YR 6/4 light yellowish brown. |
| 3 | | | | | |
| 4 | SM | 19" | 14-18<br>15-16 | 0.0 | **4-6 ft** Fine sand and silt finer than above, Bands of gray to black silt,<br>Tip of spoon is gray micaceous silt, no visible contamination, Dry throughout |
| 5 | | | | | Hue 10 YR 6/4 light yellowish brown |
| 6 | ML<br>OL | 15" | 8-4-5-4 | 0.0 | **6-8 ft** Top of spoon (4") silt and fine sand, abundant mica, little or no coarse sand<br>Middle of spoon (1") clay and silt gray low plasticity inorganic clay |
| 7 | PT | ▼ | | | Bottom of spoon (10 ") Black silty peat organic soil, trace roots and organic debris,<br>No visible contamination. Top - Hue Chart #1 for gley 4/2 dark gray.<br>Bottom - Hue chart #1 for gley 2.5 N Black |
| ▼ | ML | 12" | 8-4-6-2 | 0.0 | 8-10 ft Silt and fine sand, same as above, abundant mica. |
| 10 | | | | | Drill to 10 ft and install temporary monitoring well point, Screen interval<br>6-10 ft bgl<br>End boring |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| Schedule 40 PVC | 0.020 inch | 6-10 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/8/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 5 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 25 | - - | - - | |
| Final: | 25 | - - | - - | |

# AMAI

611 Broadway Suite 907G

New York, New York 10012

## Geologic Boring Log

**Ballast Basin Skimmer Area SWMU 44**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 44-01 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Joseph Lysonski | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/21/96 | 6/21/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Descriptions made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | - | - | - | - | **0-2 ft** Sand and silt mix, loose, slightly moist, Fine to coarse grain |
| | | | | | No visible contamination, no product odor, |
| | | | | | Quatrz, mica, pyrite, and lithic sand Hue: dark brown 7.5 YR 3/2 |
| 1 | | | | | Bottom of spoon Hue: 2.5 Y 5/3 light yellowish brown |
| | **Sample collected** | | | | Full analysis and Immunoassay samples collected |
| 2 | - | - | - | - | **2-4 ft** Sand, same as above |
| | | | | | Full analysis and Immunoassay samples collected |
| 3 | **Sample collected** | | | | End boring |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly, sandy, silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus, swamp soils, organic |

* Source Unified Soil Classification System

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## Geologic Boring Log

**Ballast Basin Skimmer Area SWMU 44**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 44-02 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Joseph Lysonski | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/20/96 | 6/20/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Descriptions made from auger cuttings, unless otherwise noted (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | - | - | - | - | **0-2 ft** Sand and silt mix, loose, slightly moist, Fine to coarse grain |
| | **Sample collected** | | | | No visible contamination, no product odor, |
| 1 | | | | | Quatrz, mica, pyrite, and lithic sand Hue: dark brown 7.5 YR 3/2 |
| | | | | | Bottom of spoon Hue: 2.5 Y 5/3 light yellowish brown |
| | | | | | Immunoassay samples collected. |
| 2 | - | - | - | - | **2-4 ft** Sand, fine to coarse, some silt, trace clay, |
| | | | | | No visible contamination, abundant quartz, mica, pyrite, and lithic sand. |
| 3 | **Sample collected** | | | | Hue 2.5 Y 5/3 light yellowish brown. Immunoassay sample collected. |
| | | | | | End boring |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4 8 | .43-2.0 | 08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly, sandy, silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus, swamp soils, organic |

* Source Unified Soil Classification System

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New York, New York 10012

## Geologic Boring Log

**Ballast Basin Skimmer Area SWMU 44**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 44-03 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Joseph Lysonski | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/21/96 | 6/21/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Descriptions made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 15" | 2-3-11-16 | | 0-2 ft Sand and silt mix, loose, slightly moist, Fine to coarse grain |
| | Sample collected | | | | No visible contamination, no product odor, Quatrz, mica, pyrite, and lithic |
| 1 | | | | | sand. Hue: dark brown 7.5 YR 3/2. Immunoassay sample collected. |
| | | | | | Bottom of spoon Hue: 2.5 Y 5/3 light yellowish brown |
| 2 | SP | 12 | 10-11-13 | | 2-3.5 ft Sand, same as above. |
| | Sample collected | | | | Immunoassay sample collected. |
| 3 | Sample collected | | | | |
| | SP | 20 | 11-12 | | 3.5-5.5 ft Sand, fine to coarse, abundant quartz sand, mica, pyrite, and lithic |
| | | | 14-14 | | fragments, No visible contamination, slightly moist, loose. |
| 4 | | | | | Hue 7.5 Y 5/3 light olive brown |
| | | | | | Full analysis and Immunoassay samples collected (8/7/96) |
| | | | | | **8/1/96 Step-out boring continued by Nestor M. Rivera (TBD sample)** |
| 5 | SP | 20 | 10-10 | | 5.5-7.5 ft Same as above Moist to wet |
| | | | 10-10 | | Full analysis and Immunoassay samples collected (8/1/96) |
| 6 | Sample collected | | | | |
| 7 | SP | 11 ▼ | 7-9-9-6 | | 7.5-9.5 ft Sand, fine to coarse, abundant quartz, mica pyrite, and lithic sand |
| | | | | | No visible contamination, Saturated |
| 8 | | | | | Top of spoon (4") Hue: 2.5 Y 5/3 light olive brown |
| | | | | | Bottom of spoon (7") Hue: chart 1 for gley 4/1 5BG) |
| | | | | | Groundwater 7.5 ft |
| 9 | | | | | End boring |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | 43-2.0 | 08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly, sandy, silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus, swamp soils, organic |

* Source Unified Soil Classification System

Prepared 6/11/97

# AMAI

611 Broadway Suite 907G

New York, New York 10012

## Geologic Boring Log

**Ballast Basin Skimmer Area SWMU 44**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 44-04 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Joseph Lysonski | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/21/96 | 6/21/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Descriptions made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | - | - | - | - | 0-2 ft Sand and silt mix, loose, slightly moist, Fine to coarse grain<br>No visible contamination, no product odor,<br>Quatrz, mica, pyrite, and lithic sand Hue: dark brown 7.5 YR 3/2<br>Bottom of spoon Hue: 2.5 Y 5/3 light yellowish brown<br>Immunoassay sample collected. |
| 1 | Sample collected | | | | |
| 2 | - | - | - | - | 2-4 ft Sand, fine to coarse, some silt, trace clay,<br>No visible contamination, abundant quartz, mica, pyrite, and lithic sand.<br>Hue 2.5 Y 5/3 light yellowish brown.<br>Immunoassay sample collected.<br>End boring |
| 3 | Sample collected | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

**Soil Descriptions***

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | 43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly, sandy, silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus, swamp soils, organic |

* Source Unified Soil Classification System

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## Geologic Boring Log

**Ballast Basin Skimmer Area SWMU 44**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 44-05 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Joseph Lysonski | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/21/96 | 6/21/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Descriptions made from auger cuttings, unless otherwise noted (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | - | - | - | - | **0-2 ft** Sand and silt mix, loose, slightly moist, Fine to coarse grain<br>No visible contamination, no product odor,<br>Quartz, mica, pyrite, and lithic sand Hue: dark brown 7.5 YR 3/2<br>Bottom of spoon Hue: 2.5 Y 5/3 light yellowish brown<br>Immunoassay sample collected. |
| 1 | **Sample collected** | | | | |
| 2 | - | - | - | - | **2-4 ft** Sand, fine to coarse, some silt, trace clay,<br>No visible contamination, abundant quartz, mica, pyrite, and lithic sand.<br>Hue 2.5 Y 5/3 light yellowish brown.<br>Immunoassay sample collected.<br>End boring |
| 3 | **Sample collected** | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly, sandy, silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus, swamp soils, organic |

* Source Unified Soil Classification System

# AMAI

611 Broadway Suite 907 G
New York, New York 10012

## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-01 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/2/96 | 7/2/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | 12 | 1-5-5-7 | 110 | **0-2 ft.** Sand. Loose, moist to saturated, light yellowish brown (2.5Y6/3) to black (Gley 1, 2.5/N) to dark gray (2.5Y4/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Hydrocarbon odor and free product observed. Full analysis and Immunoassay samples collected. |
| 1 | | ▼ | | | |
| | | | | | |
| 2 | **Sample collected** | | | | Boring terminated. |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 1.25" x schedule 40 PV | 0.020 inch | 0-5 ft. | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| none | none |

**Notes:** Well (1.25") installed on 7/15/96. Filter pack ranged from 3"-5'. Seal ranged from 0-3". Borehole partially collapsed. Screen partially exposed.

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/2/96 | Pump by hand w/Waterra foot valve and 5/8" Polyethylene hose | |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | |
| Final: | -- | -- | -- | |

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-02 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/2/96 | 7/2/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SC, S | 12 | 3-6-9-1 | 116 | **0-2 ft.** Sandy clay to sand. Loose to soft, moist to wet, light brown (7.5YR6/3) to light gray (7.5YR7/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Hydrocarbon odor and free product observed. Full analysis and Immunoassay samples collected. |
| 1 | | ▼ | | | |
| | **Sample collected** | | | | |
| 2 | SM | 8 | 4-6-6-7 | 92 | **2-4 ft.** Sand. Loose, saturated, light gray (7.5YR7/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Hydrocarbon odor and free product observed. |
| 3 | | | | | Boring terminated. |
| 4 | | | | | |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 1.25" x schedule 40 PVC | 0.020 inch | 0-5 ft. | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| none | none |

**Notes:** Well installed on 7/15/96. Filter pack ranges from 3"-5'. Seal ranges from 0-3". Riser has 32".

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| -- | Centrifugal pump using 5/8" high density polyethylene hose. | |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | |
| Final: | -- | -- | -- | |

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-03 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/2/96 | 7/2/96 | Tripod | 2"x 24" Carbon Steel Split Spn |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SC, SM | 12 | 3-5-6-10 | 0 | **0-2 ft.** Sandy clay to sand. Loose to hard, moist, light yellowish brown (2.5Y6/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Roots observed. Immunoassay samples collected. |
| 1 | | | | | |
| | Sample collected | | | | |
| 2 | SM | 24 | 9-8-6-3 | 0 | **2-4 ft.** Sand to silty sand. Loose, moist to moist, light yellowish brown (2.5Y6/3) to light gray (7.5YR7/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Immunoassay samples collected. |
| 3 | Sample collected | | | | |
| 4 | | | | | Boring terminated. |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-04 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/2/96 | 7/2/96 | Tripod. | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SC, SM | 12 | 3-5-6-10 | 0 | **0-2 ft.** Sandy clay to sand. Loose to stiff, moist, light yellowish brown (2.5Y6/3) to brown (7.5YR4/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size, fine to coarse. Iron oxide nodules and roots observed. Full analysis and Immunoassay samples collected. |
| 1 | **Sample collected** | | | | |
| 2 | SM | 24 | 9-8-6-3 | 0 | **2-4 ft.** Sand to silty sand. Loose, moist to wet, light yellowish brown (2.5Y6/3) to light gray (7.5YR7/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Iron oxide stains observed. Immunoassay samples collected. |
| 3 | **Sample collected** | | | | |
| 4 | | | | | Boring terminated. |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-05 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/2/96 | 7/2/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 18 | 2-4-5-5 | 49 | **0-2 ft.** Sandy silt to sand. Loose to stiff, moist, light yellowish brown (2.5Y6/3) to brown (7.5YR4/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. |
| 1 | | | | | |
| | Sample collected | | | | Hydrocarbon odor. Full analysis and Immunoassay samples collected. |
| 2 | SM | 24 | 5-4-4-3 | 43 | **2-4 ft.** Sand to silty sand. Loose, slightly moist, light yellowish brown (2.5Y6/3) to dark gray (7.5YR4/1). Sand composed of quartz, mica, pyrite, |
| 3 | Sample collected | | | | shell and lithic fragments varying in size, fine to coarse. Hydrocarbon odor. Roots observed. Full analysis and Immunoassay samples collected. |
| 4 | SM | 24 | 3-4-4-3 | 0 | **4-6 ft.** Sand. Loose, slightly moist, black (Gley 1, 2.5/N). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to |
| 5 | Sample collected | | | | coarse. Hydrocarbon odor. Roots observed. Full analysis and Immunoassay samples collected. |
| 6 | | ▼ | | | Boring terminated. Groundwater depth was determined using pointer. |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-06 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/1/96 | 7/1/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 12 | 3-4-6-9 | 3 | **0-2 ft.** Sandy silt to sand. Loose to stiff, moist, light yellowish brown (2.5Y6/3) to brown (7.5YR4/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments, from fine to coarse. Immunoassay samples collected. |
| 1 | Sample collected | | | | |
| 2 | SM | 24 | 9-8-8-7 | 135 | **2-4 ft.** Sand to silty sand. Loose, slightly moist, light yellowish brown (2.5Y6/3) to light gray (7.5YR7/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments, from fine to coarse. Hydrocarbon odor and staining observed. Roots observed. samples collected. |
| 3 | Sample collected | | | | |
| 4 | SM | 22 | 3-3-4-6 | 3 | **4-6 ft.** Sand. Loose, slightly moist, light gray (7.5YR7/1) to dark brown (7.5YR3/4). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Immunoassay samples collected. |
| 5 | Sample collected | | | | |
| 6 | SM | 12 ▼ | 1-3-4-3 | 3 | **4-6 ft.** Sand. Loose, slightly moist, dark gray (7.5YR4/1) to dark brown (7.5YR3/4). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Hydrocarbon odor and staining observed. |
| 7 | | | | | |
| 8 | | | | | Boring terminated. |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-07 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/1/96 | 7/1/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM, SC | 14 | 2-4-5-7 | 35 | **0-2 ft.** Clayey sand to sand. Loose, slightly moist, light yellowish brown (2.5Y6/3) to brown (7.5YR4/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size, Immunoassay samples collected. |
| 1 | **Sample collected** | | | | |
| 2 | SM | 12 | 9-9-7-6 | 1 | **2-4 ft.** Sand. Loose, slightly moist, light yellowish brown (2.5Y6/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Immunoassay samples collected. |
| 3 | **Sample collected** | | | | |
| 4 | SM | 2 | 4-2-2-5 | 0 | **4-6 ft.** Sand. Loose, wet, light yellowish brown (2.5Y6/3) to light gray (7.5YR7/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Last 4" show black organic material (naturally occurring). |
| 5 | | ▼ | | | |
| 6 | | | | | Boring terminated. |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4 8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System

# AMAI

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New York, New York 10012

## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-08 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/1/96 | 7/1/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 18 | 2-44-5-7 | 69 | **0-2 ft.** Silty sand to sand. Loose, moist, light yellowish brown (2.5Y6/3) to light brown (7.5YR6/3) to light gray (7.5YR7/1). Quartz sand, mica, pyrite, fine to coarse shell and lithic fragments. Slight hydrocarbon odor. Full analysis and Immunoassay samples collected. |
| 1 | | | | | |
| | **Sample collected** | | | | |
| 2 | SM | 18 | 6-6-5 | 9 | **2-3.5 ft.** Sand. Loose, slightly moist, light yellowish brown (2.5Y6/3) to light brown (7.5YR6/3) to light gray (7.5YR7/1). Quartz sand. mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Full analysis and Immunoassay samples collected. |
| 3 | **Sample collected** | | | | |
| | SM | 14 | 4-1-1 | 0 | |
| 4 | | ▼ | | | **3.5-5 ft.** Sand. Loose, wet to saturated, light gray (7.5YR7/1). Quartz sand quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. |
| 5 | | | | | Boring terminated. |
| 6 | | | | | |

**Soil Descriptions***

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System

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611 Broadway Suite 907 G
New York, New York 10012

## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-09 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/1/96 | 7/1/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 22 | 2-4-7-5 | 224 | **0-2 ft.** Sand to silty sand. Loose, slightly moist, light yellowish brown (2.5Y6/3) to brown (7.5YR4/3). Sand composed of quartz, mica, pyrite, |
| 1 | **Sample collected** | | | | shell and lithic fragments varying in size from fine to coarse. Full analysis and Immunoassay samples collected. |
| 2 | SM | 16 | 6-7-7 | 263 | **2-3.5 ft.** Sand. Loose, moist to wet, dark gray (7.5YR4/1) Sand composed of quartz, mica, pyrite, shell and lithic fragments |
| 3 | | ▼ | | | varying in size from fine to coarse. |
| | **Sample collected** | | | | Immunoassay samples collected. |
| 4 | | | | | Boring terminated at 3.5 ft. |

**Soil Descriptions***

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | 43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

# AMAI

611 Broadway Suite 907 G
New York, New York 10012

## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-09 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/27/96 | 6/27/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | 24 | 2-3-4-5 | 126 | **0-2 ft.** Sand. Loose, slightly moist, dark yellowish brown (10YR3/4) to black (10YR 2/1).Sand composed of quartz, mica, pyrite, shell and lithic fragments |
| 1 | **Sample Collected** | | | | size from fine to coarse. Locally silty. Immunoassay samples collected. |
| 2 | SM | 18 | 4-5-6 | 197 | **2-3.5 ft.** Sand. Loose, slightly moist, very dark gray (Gley 1,3/N) Sand composed of quartz, mica, pyrite, shell and lithic fragments |
| 3 | **Sample Collected** | | | | size from fine to coarse. Immunoassay samples collected. Strong hydrocarbon odor from 2-6 ft. Free product at bottom 0.5 ft. |
| 4 | | | | | Boring terminated at 5 ft. |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 1.25"schedule 40 PVC | 0.020 inch | 1-6 ft. | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| none | none |

**Notes:** Well completed on 7/15/96. Filter pack ranged from 3"-6'. Seal ranged from 0-3".
Soil at the bottom of the boring showed strong hydrocarbon odor and visible product.

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| -- | | |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | |
| Final: | -- | -- | -- | |

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-10 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/28/96 | 6/28/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | CL, S | 12 | 1-1-2-2 | 1 | **0-2 ft.** Clay to silty sand to sand. Stiff to loose, slightly moist, brown (7.5YR 5/3) to light yellowish brown (7.5YR2.5Y6/4). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Full analysis and Immunoassay samples collected. |
| 1 | Sample collected | | | | |
| | | ▼ | | | |
| 2 | SM | 12 | 5-2-5-7 | 25 | **2-3.5 ft.** Sand. Loose, slightly moist, light yellowish brown (7.5YR6/3) to light gray (Gley 1,7/N) Sand composed of quartz, mica, pyrite, shell and lithic fragments size from fine to coarse. Hydrocarbon odor and free product observed. |
| 3 | Sample collected | | | | Immunoassay samples collected. |
| 4 | | | | | Boring terminated at 5 ft. |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 1.25" Schedule 40 PVC | 0.020 inch | 0-5 ft. | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| none | none |

**Notes:** Well installed on 7/15/96. Filter pack ranges from 3"-5'. Seal ranges from 0-3".
Riser is 2 ft. high.

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| -- | Centrifugal pump using 5/8" high density polyethylene hose. | |

| | Temp (c) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | |
| Final: | -- | -- | -- | |

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-11 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/28/96 | 6/28/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | CL, SM | 24 | 1-1-1-5 | 0 | **0-2 ft.** Clay to sandy silt, to sand. Stiff to loose, slightly moist, brown (7.5YR4/3) to light brown (7.5YR6/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Full analysis and Immunoassay samples collected. |
| 1 | Sample collected | ▼ | | | |
| 2 | SM | 18 | 14-12-11 | 0 | **2-3.5 ft.** Sand. Loose, saturated, light yellowish brown (2.5Y6/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Last 3" show hydrocarbon odor. Immunoassay sample collected. |
| 3 | Sample collected | | | | |
| 4 | | | | | Boring terminated at 3.5 ft. |

**Soil Descriptions***

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | 4.8-19 | | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**East Aisle Ditch SWMU 45**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 45-12 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Mario Sierra | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/27/96 | 6/27/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | CL, SM | 18 | 1-1-1-1 | 0 | **0-2 ft.** Sandy clay to sand. Stiff to loose, slightly moist to wet, brown (7.5YR4/3) to light yellowish brown (2.5Y6/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Hydrocarbon odor. Full analysis and Immunoassay samples collected. |
| 1 | **Sample Collected** | | | | |
| 2 | SM | 18 | 11-10-10 | 0 | **2-3.5 ft.** Sand. Loose, wet, light yellowish brown (2.5Y6/3) to light gray (2.5Y7/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Immunoassay samples collected. |
| 3 | **Sample Collected** | | | | |
| 4 | | | | | Boring terminated. |

**Soil Descriptions***

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | < 08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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New York, New York 10012

## Geologic Boring Log

**Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-1 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/19/96 | 6/19/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | | | 0 | **0-2 ft** Sand and organic rich soil, loosely packed spoon, little gravel and rock fragments, no visible contamination, Dry throughout, Hue 7.5 Y 4/3 brown. |
| 1 | | | | | |
| 2 | SM | | | 0 | **2-4 ft** Same as above no visible contamination, dry throughout. |
| 3 | | | | | |
| 4 | SM | | | 180 | **4-6 ft** Sand and silt - fine sand and micaceous silt, no rock fragments, well sorted, slight product odor no visible contamination Dry thoughout, Hue 2.5/1 dark bluish black. |
| 5 | | | | | |
| 6 | SM | | | 290 | **6-8 ft** Sand and silt fine to medium sand and micaceous silt, Strong product odor, visible free product, moist, Hue 2.5/1 5B dark bluish black. |
| 7 | | | | | |
| 8 | SM | ▼ | | 314 | **8-8.5 ft** Same as above, saturated at 8.5 ft |
| | | | | | Drill to 11.0 ft and installed temporary monitoring well point. screen interval from 6.0 - 11.0 ft bgl. |
| 11 | | | | | End of boring |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 6-11 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/19/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 65 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | Purge water clear after 30 gallons, |
| Final: | -- | -- | -- | Free product in well |

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New York, New York 10012

## Geologic Boring Log

**Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-2 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/19/96 | 6/19/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | | | 0 | **0-2 ft** Sand and organic rich soil, loosely packed spoon, little gravel and rock fragments, no visible contamination, Dry throughout, Hue 7.5 Y 4/3 brown. |
| 1 | | | | | |
| 2 | SM | | | 61 | **2-4 ft** Same as above, sand and silt, slight product odor, Dry throughout No visible contamination, Hue chart #2 for gley 2.5/1 10 B. Bluish black. |
| 3 | | | | | |
| 4 | SM | | | 301 | **4-6 ft** Sand and silt - same as above, strong product odor, Dry thoughout, Hue 2.5/1 dark bluish black. |
| 5 | | | | | |
| 6 | MI | | | 271 | **6-8 ft** Sand and silt, same as above, strong product odor, no visible contamination, Dry at 6 ft, moist at 8 ft, Hue 2.5/1 5B dark bluish black. |
| 7 | | | | | |
| 8 | SM | ▼ | | 179 | **8-9 ft** Saturated. Drill to 12.0 ft and installed temporary monitoring well point. screen interval from 7.0 - 12.0 ft bgl. |
| 11 | | | | | End boring |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 6-11 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/19/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 55 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | Purge water clear after 30 gallons, |
| Final: | -- | -- | -- | Free product in well |

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New York, New York 10012

## Geologic Boring Log

**Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-3 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/19/96 | 6/19/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | | | 0 | **0-2 ft** Organic rich soil, few rock fragments, little or no gravel, some fine silt, backfill zone, no visible contamination, Dry throughout Hue 7.5 Y 4/3 brown. |
| 1 | | | | | |
| 2 | SM | | | 0 | **2-4 ft** Same as above no visible contamination, dry throughout. |
| 3 | | | | | |
| 4 | SM | | | 0 | **4-6 ft** Same as above, no visible contamination, dry throughout. |
| 5 | | | | | |
| 6 | MI | | | 290 | **6-10 ft** Sand - fine silty sand, little or no gravel or rock fragments, slightly darker and denser than above, no visible contamination, Dry throughout, Hue chart #2 for gley 5/1 greenish gray. |
| 10 | MI | ▼ | | 0 | **10 ft** Sand and silt mix, no visible contamination, Saturated, Hue #2 for gley 2.5/1 10 B bluish black<br>Drill to 20 ft and installed temporary groundwater monitoring well point at 20 ft bgl screen 10-20 ft |
| 11 | | | | | |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 10-20 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:**
Flush mounted

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/19/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 55 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | 1,110 | 6.87 | Purge water clear after 30 gallons. |
| Final: | -- | 1,180 | 6.79 | |

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New York, New York 10012

## Geologic Boring Log

**Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-4 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/20/96 | 6/20/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SP | | | 0 | **0-2 ft** Sand and silt, fine sand and silt with little gravel and rock fragments backfill zone, no visible contamination, Dry throughout, Hue 7.5 Y 4/3 brown. |
| 1 | | | | | |
| 2 | SP | | | 0 | **2-4 ft** Sand silt and large rubble, sand and silt mixture with abundant large gravel and concrete rubble, backfill zone, no visible contamination, Dry throughout, Hue 7.5 Y 4/3 brown. |
| 3 | | | | | |
| 4 | SM | | | 105 | **4-6 ft** Sand med to fine sand and silt mix, little product odor, no visible contamination, Dry throughout Hue # 2 for gley 3/1 10 BG dark greenish gray. |
| 5 | | | | | |
| 6 | SM | | | 150.3 | **6-8 ft** Sand - fine silty sand, well graded, dense, some product odor, moist, no visible contamination, Hue chart #2 for gley 3/1 10 BG dark greenish gray. |
| 7 | | ▼ | | | |
| 8 | SM | | | 97.6 | **8-10 ft** Sand and silt, same as above, saturated throughout, strong product odor, no visible contamination, Hue #2 for gley 3/1 10 BG dark greenish gray. Drill to 12.5 ft and installed temporary monitoring well point screen 7.5 ft - 12.5 ft |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 7.5-12.5 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/19/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 55 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | Purge water clear after 30 gallons. |
| Final: | -- | -- | -- | |

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## Geologic Boring Log

**Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-5 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/2/96 | 8/2/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| | | | | | No splitspoon sampling |
| | | | | 248 | Cuttings were fine sand throughout, locally, gravel |
| | | | | | Drill to 17 ft and installed temporary monitoring well point |
| | | | | | Groundwater encountered at 9 ft |
| | | | | | Free product found in cuttings |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 5-15 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

Notes: Grout 0-1 ft bgl - Bentonite seal 1-3 ft bgl - Filter pack 3-15 ft bgl

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/12/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 15 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 32.2 | 5,680 | 6.59 | Free product in well |
| Final: | 31.8 | 6,190 | 6.60 | |

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## Geologic Boring Log

**Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-6 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/2/96 | 8/2/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| | | | | 198 | No splitspoon sampling<br>Cuttings were fine sand throughout, locally, gravel<br>Drill to 15 ft and installed temporary monitoring well point<br>Groundwater encountered at 9 ft<br>Free product in cuttings |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 5-15 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:** Grout 0-2 ft bgl - Bentonite 1-3 ft bgl - Filter pack 3-15 ft

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/12/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 15 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 33.6 | 8,090 | 6.72 | Free product in well |
| Final: | 33.3 | 7,350 | 6.73 | |

# AMAI

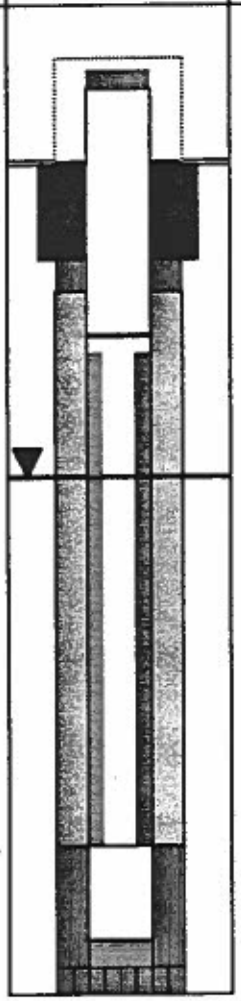
611 Broadway Suite 907 G
New York, New York 10012

## Well Log



**Main Dock Sump SWMU 33**

| Well ID: | Client: | Project: | Location: |
|---|---|---|---|
| MDS-6R | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa Puerto Rico |
| **Project No.:** | **AMAI Geologist/Engineer:** | **Driller:** | **Drilling contractor:** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started:** | **Date Completed:** | **Drilling Method:** | **Fluid:** |
| 8/15/96 | 8/15/96 | 3.25" ID - 6.00" OD Hollow Stem Auger | None |

| Depth bgl ft. | Well Construction | USCS symbol | Recovery (per 24 ") | Blow Counts (6" ea.) | PID (ppm) | Soil Description (Descriptions made from auger cuttings unless otherwise noted (grain size, ** hue/color, moisture, sorting etc.) |
|---|---|---|---|---|---|---|
| 0 |  | SM | | | 0 | 0-2 ft Sand and organic rich soil, no visible contamination Dry Hue 7.5 Y 4/3 Brown |
| 2 | | | | | | |
| 4 | | SM | | | 0 | 2-4 ft Same as above, slight hydrocarbon odor, dry throughout Hue 7.5 Y 4/3 Brown |
| 6 | | | | | | |
| 8 | | SM | | | 175 | 4-6 ft Fine sand and silt mix, strong product odor, visible free prduct in cuttings Dry, Hue chart #2 for gley 2.5/1 5B dark greenish gray |
| 10 | | | | | | |
| 12 | | SM | | | 195.2 | 6-8 ft Same as above, Dry, visible free product, strong product odor, Hue chart #2 for gley 2.5/1 5B dark greenish gray |
| 14 | | | | | | |
| 16 | | SM | | | 375 | 8-10 ft Fine sand and some silt, visible contamination, visible free product Little or no gravel or coarse sand, Saturated at 10 ft |
| 18 | | | | | | Drill to 25ft and install recovery well , Screened interval 4.5- 19.5 ft |
| 20 | | | | | | |
| 22 | | | | | | |
| 24 | | | | | | |

**Key to well construction**

- Standing W.L.
- Land surface
- Security casing
- Bottom of borehole
- End cap
- Bentonite slurry
- Concrete
- Well casing
- Screened interval
- Filter pack

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## Well Log

(continued)

**Main Dock Sump SWMU 33**

| Location | Client: | Project: | Project number |
|---|---|---|---|
| bucoa, P.R. | Puerto Rico Sun Oil Company | RCRA Facility Investigation | |

| Depth bgl (ft.) | USCS Symbol (ppm) | Reco-very (per 24") | Blow Counts (6"ea.) | PPM (ppm) Time | Soil Description<br>Descriptions made from auger cuttings unless otherwise noted<br>(grain size, ** hue/color, moisture, sorting etc.) |
|---|---|---|---|---|---|
| | | | | | |

### Well Construction Details

| Casing material | Screen slot size | Filter pack | Well cap type | Bottom |
|---|---|---|---|---|
| 4" x schedule 40 PVC | 0.020 inch | No. 2 Silica Sand | Watertight | Well point |

| Security casing/manhole: | Lock type: |
|---|---|
| Standing 36" steel security casing | American keyed-alike (aluminum body) |

Notes:

### Well Development Data

Date: Technique: Volume purged:

Centrifugal pump using 5/8" high density polyethylene hose.

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 9,960 | 6.47 | No product in well at time of develpment |
| Final: | 25 | 16,740 | 6.86 | |

### *Soil Descriptions

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| ıgularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System. **Hue and color based on MUNSELL Soil color charts

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## Geologic Boring Log

**Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-7 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/1/96 | 8/1/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| | | | | | No splitspoon sampling<br>Silty sand to med. sand, slightly moist, to saturated, sand ranges in size, from fine to coarse, composed of quartz, mica, pyrite, and lithic fragments, roots,<br>Hue 10 YR 5/6 yellowish brown, and gley #1 3/1 N very dark gray, to greenish gray gley #1 5/1 10 Y<br>Groundwater encountered at 9 ft<br>Free product found in cuttings<br><br>Drill to 15 ft bgl and installed temporary groundwater monitoring well point |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch. | 5-15 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

Notes: Grout 0-1 ft bgl - Bentonite seal 1-3 ft bgl - Filter pack 3-15 ft bgl

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/12/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 15 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 6,450 | 6.78 | Free product in well |
| Final: | 25 | 5,860 | 6.83 | High yield > 5gpm |

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# Geologic Boring Log

 **Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-8 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/7/96 | 8/7/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SP | 18" | 7 | 0 | **0-2 ft** Backfill zone very dry sandy, poorly graded, no visible contamination, Hue 2.5 Y 6/2 light brownish gray |
| 1 | | | | | |
| 2 | SP | 19" | 3-4-4-9 | 1.3 | **2-4 ft** Backfill zone very dry sand and gravel, same as above. Hue 2.5 Y 6/2 light brownish gray |
| 3 | | | | | |
| 4 | GM | 0" | | 0 | **4-6 ft** No sample (large gravel) |
| 5 | | | | | |
| 6 | SM | 23" | 5-8-7-7 | 0.7 | **6-8 ft** Medium to fine sand, gray bands of silt, some gravel and rock fragments, Dry, Hue 7.5 YR 6/3 light brown. |
| 7 | | | | | |
| 8 | SM | 24" | 7-9-7-6 | 0 | **8-10 ft** Top of spoon (12")Medium to fine sand and silt, same as above, little or no coarse sand or gravel, Dry<br>Hue 10 YR 3/3 dark brown |
| 9 | | ▼ | | | Bottom of spoon (4") Hue 10 YR 6/4 light yellowish brown |
| 10 | SM | 16 " | 5-8<br>11-13 | 0 | **10-12 ft** Medium to fine sand and silt, bands of gray silt and med to fine sand. little or no coarse sand<br>Saturated, no visible contamination,<br>Hue 10 YR 6/4 light yellowish brown |
| ▼ | | | | | Drill to 17 ft and installed temporary monitoring well point. Screen interval 7-17 ft |
| 17 | | | | | End of boring |

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## Geologic Boring Log

(Continued) Page 2 of 2 **Main Dock Sump SWMU 33**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| MDS-8 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/7/96 | 8/7/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2 " x schedule 40 PVC | 0.020 inch | 7-17 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/19/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 55 gallons |

| | Temp °C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | -- | -- | -- | Purge water clear after 30 gallons |
| Final: | -- | -- | -- | |

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BDS-1 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/18/96 | 6/18/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | | | 0 | **0-2 ft** Sand and silt mix, fine silty sand , little or no gravel or rock fragments. Trace seashell fragments, no visible contamination, no product odor, Dry |
| 1 | | | | | Hue 10.5 YR 4/3 brown. Immunoassay samples collected. |
| | **Sample collected** | | | | |
| 2 | SM | | | 0 | **2-4 ft** Sand and silt mix. Same as above, no visible contamination. Immunoassay samples collected. |
| 3 | **Sample collected** | | | | |
| 4 | SM | ▼ | | 309 | **4-6 ft** Sand and silt mix, same as above, groundwater encountered at 4 ft. Abundant dark gray silt, Saturated thoughout. Product odor in cuttings |
| 5 | | | | | Hue 2.5 Y 4/2 Dark grayish brown. |
| 6 | | | | | **6-8 ft** No description |
| 7 | | | | | |
| 8 | SM | | | -- | **8-10 ft** |
| 9 | | | | | |
| 10 | SM | | | 169.4 | **10-13 ft** Med to fine silty sand, coarser than above. Hue 2.5 Y 4/2 Dark grayish brown |
| ↓ | | | | | Drill to 13 ft and installed temporary monitoring point at 13 ft. Screen from 3-13 ft bgl. |
| 13 | | | | | End of boring |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2"x Schedule 40 PVC | 0.020 inch | 3-13 ft. | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| 36" above ground galvanized casing | American aluminum body (key-alike) |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/22/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 55 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 1,040 | -- | Water clears after development strong product odor. |
| Final: | 25 | 1,020 | -- | Well yields 5 gpm + for 25 min. |

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BDS-2 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/18/96 | 6/18/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery Symbol | Blow Counts Symbol | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | 20" | 4-5-3-3 | 0 | **0-2 ft** Sand - fine silty sand little or no gravel or rock fragments, Dry loosely packed spoon. no visible contamination, Hue 10.5 YR 4/3 brown. Full analysis and Immunoassay samples collected |
| 1 | | | | | |
| | **Sample collected** | | | | |
| 2 | SM | 20" | 4-3-3-3 | 0 | **2-4 ft** Sand and silt mix, same as above, little or no larger sizes, No visible contamination, Dry, Hue 2.5 Y 4/2 dark grayish brown, Full analysis and Immunoassay samples collected. |
| 3 | | | | | |
| | **Sample collected** | | | | |
| 4 | SM | | | 0 | **4-6 ft** Same as above, some product odor, Groundwater encountered at 6 ft |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | ▼ | | | Goundwater encountered at 8 ft |
| | | | | | Drill to 11 ft and installed temporary monitoring point, screen 6-11 ft |
| ▼ | | | | | |
| 11 | | | | | End of boring. |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 6-11 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| none | none |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/9/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 60 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 1,110 | 6.87 | Purge water clear after pumping |
| Final: | 25 | 1,180 | 6.79 | Product odor in well Yield 5 gpm+ |

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BDS-3 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/1/96 | 7/1/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 18" | 2-2-3-4 | 0 | **0-2 ft** Dig 3 feet by hand to clear for underground utilities, Sample 1 ft offset |
| 1 | | | | | **0-2 ft** Sand and gravel mix, backfill zone abundant rock fragments, no visible contamination, Dry throughout, Hue YR 4/3 brown. |
| 2 | SM | 24" | 2-2-1-2 | 0 | **2-4 ft** Gravel, sand and silt mix, still backfill zone, abundant rock fragments, Sandy silt, little or no larger sizes, Dry no visible contamination. |
| 3 | | | | | no visible contamination, Hue 10.5 YR 4/3 brown. |
| 4 | SM | 20" | 2-2-1-2 | 0 | **4-6 ft** Sand and silt little or no gravel, |
| 5 | | | | | loosely packed spoon, no visible contamination, Hue 2.5 Y 4/2 dark grayish brown. |
| 6 | SM | 20" | 2-2-1-2 | 315 | **6-8 ft** Top of spoon (8") - Same as above.Bottom of spoon (12") - Sand and silt, |
| 7 | | | | | little or gravel, change in color, slightly darker than above. Strong product odor, Dry throughout, moist at tip. Visible free product |
| | Sample collected | | | | in thin layers. Full analyses and Immunoassay samples collected. |
| 8 | | ▼ | | | **8-10 ft** Sand med to fine, well graded sand, strong product odor, visible free product in soil, Saturated, Hue chart #1 for gley 4/10 Y 10BG Dark greenish gray |
| | | | | | Drill to 16 ft and installed temporary monitoring well point at 16 ft screen 6-16ft |
| 16 | | | | | End of boring |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 6-16 ft | No. 2 Silica sand | Vacuum |

| Security casing/manhole: | Lock type: |
|---|---|
| None | American aluminum body (key-alike) |

**Notes:**

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/19/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 55 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 1,110 | 6.70 | Water clears after development strong product odor. |
| Final: | 25 | 1,020 | 6.83 | Sheen in purge water drum. |

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New York, New York 10012

## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 34-03 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/17/96 | 6/17/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Descriptions made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SP | 21" | 6-2-2-2 | 0 | **0-2 ft** Fine sand and silt mix, some gravel, little or no rock fragments backfill zone, no visible contamination, very dry, loosely packed |
| 1 | | | | | spooon, Hue 10.5 YR 4/3 brown, Immunoassay sample collected. |
| | **Sample collected** | | | | |
| 2 | SP | 19" | 2-3-4-2 | 0 | **2-4 ft** Sand and silt mix, same as above, no visible contamination, |
| 3 | **Sample collected** | | | | Very dry, Hue 2.5 Y 4/2 Dark grayish brown, Immunoassay sample collected. |
| 4 | | | | | End of boring. |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly, sandy, silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus, swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BDS-4 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/5/96 | 8/5/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| | | | | | No splitspoon sampling<br>Cuttings show sand throughout,<br>Drill to 15 ft bgl and installed temporary monitoring well point at 14 ft bgl |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 4-14 ft bgl | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:** Grout 0-0.5 ft bgl - Bentonite seal 0.5-2.0 ft bgl - Filter pack 2.0-14 ft bgl

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/12/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 50 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 940 | 6.78 | |
| Final: | 25 | 950 | 6.72 | |

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 34-04 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/21/96 | 6/21/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Descriptions made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SP | 18" | 3-3-4-4 | 0 | 0-8" Concrete coring |
| 1 | | | | | 8"-2 ft Sand and gravel mix, backfill zone, no product odor, Dry, Hue 5Y 4/2 olive gray. Immunoassay sample collected. |
| | Sample collected | | | | |
| 2 | SP | 18" | 3-3-3-3 | 106.7 | 2-4 ft Fine sand and silt mix, Some rock fragments, little or no gravel, still in backfill zoe, some product odor, Dry throughout, Hue #1 for gley |
| 3 | Sample collected | | | | 10 Y 3/1 dark greenish gray, no visible contamination. |
| 4 | SM | 19" | 1-2-2-2 | 505.6 | 4-6 ft Fine sand and silt mix, (micaceous) no rock fragments or gravel, below Backfill zone, strong product odor no visible contamination, Dry throughout, |
| 5 | | | | | Hue #2 for gley 4/2 dark bluish black. |
| 6 | SM | 16" | 2-2-2-2 | 523.8 | 6-8 ft Fine sand- same as above, strong product odor, Bottom (3") saturated with water and free product Top (9") stained with free product. |
| 7 | | ▼ | | | Groundwater encountered at 8 ft from grade, Full analysis and Immunoassay samples collected. |
| 8 | Sample collected | | | | End of boring |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly, sandy, silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus, swamp soils, organic |

* Source Unified Soil Classification System.

# AMAI

611 Broadway Suite 907G
New York, New York 10012

## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 34-05 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 6/24/96 | 6/24/96 | 3.25" ID - 6.00" OD Hollow Stem Auger | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | 18 | 2-8-3-19 | 8 | **0-2 ft.** Sand. Poorly graded, loose, slightly moist to wet, yellowish brown (10 YR 5/4). Sand composed of quartz, mica, pyrite, shell and lithic fragments, ranging in size from fine to coarse grained. Immunoassay (PAH) samples collected. |
| 1 | | | | | |
| 2 | SM | 24 | 33-21<br>17-11 | 40 | **2-4 ft.** Same as above. Sand was dense. Hydrocarbon odor. Immunoassay sample collected. |
| 3 | | | | | |
| 4 | | | | | No sample collected. |
| 5 | | | | | |
| 6 | SM | 24 | 11-12<br>10-9 | 203 | **6-8 ft.** Same as material of 0-2 ft. Hydrocarbon odor and staining. Full analyses and Immunoassay samples collected. |
| 7 | | | | | |
| 8 | | ▼ | | | Drilling groundwater encountered. Boring terminated. |

**Sample Collected** (0-2 ft.)

**Sample Collected** (2-4 ft.)

**Sample Collected** (6-8 ft.)

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BDS-5 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/5/96 | 8/5/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| | | | | 164.0 | No splitspoon sampling<br>Cuttings show sand throughout, loose slightly moist to saturated<br>Drill to 14 ft bgl and installed temporary monitoring well point at 14 ft bgl. |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 4-14 ft bgl | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

Notes: Grout 0-0.5 ft bgl - Bentonite seal 0.5-2.0 ft bgl - Filter pack 2.0-14 ft bgl

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/12/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 50 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC -specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 1,310 | 6.88 | |
| Final: | 25 | 1,240 | 6.78 | |

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BDS-6 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/5/96 | 8/5/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| | | | | | No splitspoon sampling<br>Cuttings show sand throughout, brown to gray<br><br>Drill to 15 ft bgl and installed temporary monitoring well point at 13 ft bgl |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 3-13 ft. | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:** Grout 0-0.5 ft bgl - Bentonite seal 0.5-2.0 ft bgl - Filter pack 2.0-13 ft bgl

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/12/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 139 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 28 | 1,470 | 7.06 | High yield > 5gpm |
| Final: | 28.5 | 1,330 | 6.92 | |

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BDS-7 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/5/96 | 8/5/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| | | | | | No splitspoon sampling<br>Cuttings show sand throughout<br>Drill to 14 ft bgl and installed temporary monitoring well point at 13 ft |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| 2" x schedule 40 PVC | 0.020 inch | 3-13 ft | No. 2 Silica sand | Watertight |

| Security casing/manhole: | Lock type: |
|---|---|
| None | None |

**Notes:** Grout 0-3"bgl - Bentonite seal 3"-1.5 ft - Filter pack 1.5 ft - 3 ft

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 8/12/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 70 gallons |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC - specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 6,450 | 6.78 | Free product in well |
| Final: | 25 | 5,860 | 6.83 | High yield > 5gpm |

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 34-07 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/5/96 | 8/5/96 | 3.25"ID - 6.00" OD Hollow Stem Auger | 2"x 24" Carbon Steel Split Spn |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SP, SM | 18 | 2-4-5-7 | -- | **0-2 ft.** Gravelly sitlty sand to sand. Poorly graded, loose, slightly moist. Dark brown (7.5YR3/2) to yellowish brown (10YR5/4). Sand composed of quartz, mica, pyrite, shell and lithic fragments, varying in size from fine to coarse grained. |
| 1 | | | | | |
| 2 | CL, SP | 18 | 2-3-7-11 | -- | **2-4 ft.** Gravelly sandy clay to sand. Poorly graded, stiff to loose, dark brown (7.5YR3/3). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Gravel composed of granodiorite. |
| 3 | | | | | |
| 4 | SM | 19 | 8-9-8-8 | -- | **4-6 ft.** Sand. Poorly sorted, loose, moist to saturated, dark brown (7.5YR3/3) to yellowish brown (10YR5/4). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Full analyses and immunoassay samples collected. Drilling groundwater encountered. Boring terminated. |
| | Sample collected | | | | |
| 5 | | | | | |
| 6 | | ▼ | | | |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**Barge Dock Sump SWMU 34**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| 34-08 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Néstor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 8/5/96 | 8/5/96 | 3.25" ID - 6.00" OD Hollow Stem Auger | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | 21 | 2-5-8-12 | -- | **0-2 ft.** Sand. Poorly graded, loose to medium dense, slightly moist, brown (10YR4/3) to very dark gray (10YR3/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. |
| 1 | | | | | |
| 2 | SM | 8 | 9-7-7-7 | -- | **2-4 ft.** Same as above. |
| 3 | | | | | |
| 4 | SM | 24 | 6-5-6-7 | -- | **4-6 ft.** Sand. Poorly graded, loose, slightly moist to saturated, black (5Y2.5/1) to gray (5Y6/1). Sand composed of quartz, mica, pyrite, shell and lithic fragments varying in size from fine to coarse. Full analyses and Immunoassay samples collected. Boring terminated. Groundwater level encountered at 5 ft. |
| | Sample collected | | | | |
| 5 | | ▼ | | | |
| 6 | | | | | |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| Soil density | very loose | loose | med. dense | Sand | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| Angularity | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

# AMAI

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New York, New York 10012

## Geologic Boring Log

**Background Soil Sampling**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BG-01 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/10/96 | 7/10/96 | 3.25" ID - 6.00" OD Hollow Stem Auger | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Recovery (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.)) |
|---|---|---|---|---|---|
| 0 | SM | 18" | 2-2-3-2 | 0 | **0-2 ft** Sand and silt mix, some gravel, organic rich soil, roots, no visible contamination, loose, moist, Hue 10 YR 5/3 brown |
| | **Sample collected** | | | | |
| 1 | | | | | MSL Metals sample collected |
| 2 | SM | 22" | 1-3-1-1 | 0 | **2-4 ft** Sand and silt mix, little or no gravel, 1" band of clay at 6" from top of spoon, no visible contamination loose, soft, Hue 10 YR 5/4 yellowish brown |
| 3 | **Sample collected** | | | | MSL Metals sample collected |
| 4 | | | | | End of boring. |

**Soil Descriptions***

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System.

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## Geologic Boring Log

**Background Soil Sampling**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BG-02 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/22/96 | 7/22/96 | 3.25" ID - 6.00" OD Hollow Stem Auger | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description<br>Description made from auger cuttings, unless otherwise noted.<br>(grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | ML/SP | 18 " | 2-3-3-3 | 0 | **0-2 ft** Top (2") Top soil described as sandy silt, stiff, slightly moist, Hue 10 YR 4/3 brown to very dark brown 10 YR 2/2 Middle (14") Sand, loose slightly moist, fine to very coarse, Hue 10 Y 4/3 dark brown to very dark brown 10 YR 4/3 Bottom (2") Clay, stiff slightly moist Hue (same as above) MSL Metals sample collected |
| | **Sample collected** | | | | |
| 1 | | | | | |
| 2 | CL | 20" | 7-8-7-9 | 0 | **2-4 ft** Sandy clay, stiff, slightly moist, sand varies in size from fine to coarse, composed of quartz, mica, pyrite, and lithic fragments. Hue 5 YR 4/4 |
| 3 | **Sample collected** | | | | MSL Metals sample collected |
| 4 | | | | | End of boring |

**Soil Descriptions***

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | 43-2.0 | .08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | Peat | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System

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## Geologic Boring Log

**Background Soil Sampling**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| BG-03 | Puerto Rico Sun Oil Company | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| **Project No.** | **AMAI Geologist/Engineer** | **Driller** | **Drilling Contractor** |
| | Nestor M. Rivera | Constancio Olivo | Jaca & Sierra |
| **Date Started** | **Date Completed** | **Drilling Method** | **Sampler type** |
| 7/22/96 | 7/22/96 | Tripod | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft.) | USCS Symbol | Reco-very (per 24") | Blow Counts (per 6") | PID (ppm) | Soil Description (Description made from auger cuttings, unless otherwise noted. (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | ML | 18 " | 2-4-6-6 | 0 | **0-2 ft** Top soil described as sandy silt, stiff, slightly moist, Varying in size from fine to coarse Hue 10 YR 4/3 brown composed of quartz, mica, pyrite, and lithic fragments. MSL Metals sample collected. |
| | **Sample collected** | | | | |
| 1 | | | | | |
| 2 | CL/SP | 16" | 4-5-4-9 | 0 | **2-4 ft** Top (4") Clay, stiff, slightly moist, composed of quartz, mica, pyrite, and lithic fragments. Middle (4") Sand, loose slightly moist, composed of quartz, mica, pyrite, and lithic fragments, varying in size from fine to coarse, Bottom (8") Clay, stiff, slightly moist. Hue 10 YR 4/3 brown MSL Metals sample collected. |
| 3 | **Sample collected** | | | | |
| 4 | | | | | End of boring |

### Soil Descriptions*

| Type | Size (mm) | | | Gravel | Sym | | Silt & Clay | Sym | |
|---|---|---|---|---|---|---|---|---|---|
| | *Coarse* | *Medium* | *Fine* | no fines | GW | well graded gravel | *Inorganic* | | |
| Gravel | 19-75 | | 4.8-19 | little fines | GP | poorly graded gravel | low plast. | ML | silts and very fine sand |
| Sand | 2.0-4.8 | .43-2.0 | 08-.043 | some fines | GM | sand,silt,gravel mix | low plast. | CL | gravelly,sandy,silty clay |
| Silt & clay | | | <.08 | some fines | GC | sand,clay,gravel,mix | high plast. | MH | micaceous/diatomaceous |
| **Soil density** | very loose | loose | med. dense | **Sand** | | | high plast. | CH | high plasticity clay |
| | dense | very dense | | no fines | SW | well graded gravelly | *Organic* | | |
| **Angularity** | very ang. | angular | sub angular | little fines | SP | poorly graded gravelly | low plast. | OL | silty clay low plasticity |
| | sub round | rounded | well round | some fines | SM | silty-sand sandy-silt | high plast. | OH | clay med. to high plasticity |
| Note - density also in blows/foot above | | | | some fines | SC | sand clay mixture | **Peat** | PT | humus,swamp soils, organic |

* Source Unified Soil Classification System

# AMAI

611 Broadway Suite 907 G
New York, New York 10012

## Geologic Boring Log

**Dock Area**

| Boring ID | Client: | Project: | Location |
|---|---|---|---|
| A-1 | Puerto Rico Sun Oil Co. | RCRA Facility Investigation | Yabucoa, Puerto Rico |
| Project No. | AMAI Geologist/Engineer | Driller | Drilling Contractor |
| | Gustavo Felipe | Constancio Olivo | Jaca & Sierra |
| Date Started | Date Completed | Drilling Method | Sampler type |
| 7/02/96 | 7/02/96 | 3.25" ID - 6.00" OD Hollow Stem | 2"x 24" Carbon Steel Split Spoon |

| Depth bgl (ft) | USCS Symbol | Recovery (per 24") | Blow Counts (6" each) | PID (ppm) | Soil Description (grain size, sorting, moisture, color/hue etc.) |
|---|---|---|---|---|---|
| 0 | SM | | - | 0.0 | **0-2 ft Fine sand and silt mix, little or no gravel, or rock fragments,** Dry, No visible contamination, Hue 10 YR 5/3 brown |
| 1 | | | | | |
| 2 | SM | | | 0.0 | **2-4 ft** Same as above, no visible contamination |
| 3 | | | | | |
| 4 | SM | | | 0.0 | **4-6 ft** - Same as above, no visible contamination. |
| 5 | | | | | |
| 6 | SM | | | 0.0 | **6-8 ft** - Same as above, Slightly finer grains, no visible contamination |
| 7 | | | | | |
| 8 | SM | | | 0.0 | **8-10 ft** - Fine sand and silt (micaceous) no larger grains, no visible contamination, Saturated, Hue chart #1 for gley 10 Y 4/1 dark greenish gray |
| 9 | | ▼ | | | Drill to 17 ft and install temporary monitoring well point at 17 ft screen 7-17 ft |
| 17 | | | | | End boring |

### Well Construction Details

| Casing material | Screen slot size | Screen Interval | Filter Pack | Cap Type |
|---|---|---|---|---|
| Schedule 40 PVC | 0.020 inch | 7-17 ft | No. 2 Silica sand | Watertight cap |

| Security casing/manhole: | Lock type: |
|---|---|
| 36" standing galvanized steel casing | American |

Notes:

### Well Development Data

| Date: | Technique: | Volume purged: |
|---|---|---|
| 7/19/96 | Centrifugal pump using 5/8" high density polyethylene hose. | 55 gal |

| | Temp (°C) | SC (µS/cm) | pH | Notes: SC- specific conductance |
|---|---|---|---|---|
| Initial: | 25 | 1050 | 6.17 | Water clear after purging |
| Final: | 25 | 1090 | 6.75 | Well dries at 5 gpm |

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI  Boring: 39-01  Pg. 1 of 1

Drilling Co: PACE  Drilling Method: Direct-push  Date Started: 4/15/03

Location: SCYI  Sampler / Drop: 2-inch macrocore  Date Completed: 4/15/03

Yabucoa, Puerto Rico  Desc. of Meas Pt: Top of PVC Casing  Logged by: N. Rivera

Surface Elev.:  Meas. Pt. Elev:  Reviewed by: M. Stein

| | BLOWS/6 in. | RECOVERY (in) | PID (ppm) | SAMPLES | DEPTH (ft) | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|---|
| | | 46 | 0.0 | | | | (0-46") gravelly, sandy, silty CLAY, light yellow, dark brown. | CL |
| | | | 0.0 | | | | | |
| 2 | | | 0.0 | 39-01 1.5-2.0 | 2 | | | |
| | | | 0.0 | | | | | |
| 4 | | | | | 4 | | Bottom of boring @ 4 feet. | |

WELL SCYI-RFI.GPJ AMAI.GDT 6/19/03

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FAX: 914-251-1286
AMAI

LEGEND

☒ Sample Interval

Water Level ATD _____ ft bgl ▽

Water Level _____ ft bgl ▼

Notes:

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI  Boring: 39-03  Pg. 1 of 1

Drilling Co: PACE  Drilling Method: Direct-push  Date Started: 4/15/03

Location: SCYI  Sampler / Drop: 2-inch macrocore  Date Completed: 4/15/03

Yabucoa, Puerto Rico  Desc. of Meas Pt: Top of PVC Casing  Logged by: N. Rivera

Surface Elev.: _____  Meas. Pt. Elev: _____  Reviewed by: M. Stein

| BLOWS/6 In. | RECOVERY (in) | PID (ppm) | SAMPLES | DEPTH (ft) | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|
| | 46 | 0.0 | | | | (0-18") sandy, silty CLAY, brown, light yellow, hard, rock fragments. | CL |
| | | 0.0 | 39-03 1.0-1.5 | | | | |
| | | | 39-03 1.5-2.0 | | | (18-30") Same as above. Color is black with sulfur fragments. | |
| | | 0.0 | | 2 | | | |
| | | | | | | (30-46") Same as above. Without sulfur fragments. | |
| | | 0.0 | | | | | |
| | | | | 4 | | Bottom of boring @ 4 feet. | |

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Water Level _____ ft bgl ▼

Notes:

WELL SCYI-RFI.GPJ AMAI.GDT 6/19/03

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI  Boring: BG-4  Pg. 1 of 1

Drilling Co: PACE  Drilling Method: Direct-push  Date Started: 4/16/03

Location: SCYI  Sampler / Drop: 2-inch macrocore  Date Completed: 4/16/03

Yabucoa, Puerto Rico  Desc. of Meas Pt: Top of PVC Casing  Logged by: N. Rivera

Surface Elev.:  Meas. Pt. Elev:  Reviewed by: M. Stein

| | BLOWS/6 in. | RECOVERY (in) | PID (ppm) | SAMPLES | DEPTH (ft) | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|---|
| | | 46 | 0.0 | BG-4 0.0-0.5 | | | (0-3") Topsoil: silty SAND/sandy SILT, dark brown, slightly moist, loose, roots. | SM |
| | | | | | | | (3-46") SAND, medium to coarse grained, light gray, slightly moist, loose, shell, coral, gastropod fragments. | SW |
| | | | 0.0 | | | | | |
| | | | 0.0 | BG-4 1.5-2.0 | 2 | | | |
| | | | 0.0 | BG-4 3.0-3.5 | | | | |
| | | | | | 4 | | Bottom of boring @ 4 feet. | |

2

4

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☒ Sample Interval

Water Level ATD _____ ft bgl ▽

Water Level _____ ft bgl ▼

Notes:

WELL SCYI-RFI.GPJ AMAI.GDT 6/19/03

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI | Boring: **BG-5** | Pg. 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Drilling Co: | PACE | Drilling Method: | Direct-push | Date Started: | 4/16/03 |
| Location: | SCYI | Sampler / Drop: | 2-inch macrocore | Date Completed: | 4/16/03 |
| | Yabucoa, Puerto Rico | Desc. of Meas Pt: | Top of PVC Casing | Logged by: | N. Rivera |
| Surface Elev.: | | Meas. Pt. Elev: | | Reviewed by: | M. Stein |

| BLOWS/6 in. | RECOVERY (in) | PID (ppm) | SAMPLES | DEPTH (ft) | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|
| | 44 | 0.0 | BG-5 0.0-0.5 | | | (0-4") organic soil, black, roots. | OL |
| | | 0.0 | | | | (4-44") gravelly, sandy, silty CLAY, light brown, slightly moist, stiff, granodiorite fragments. | CL |
| | | 0.0 | BG-5 1.5-2.0 | 2 | | | |
| | | 0.0 | BG-5 3.0-3.5 | | | | |
| | | | | 4 | | Bottom of boring @ 4 feet. | |

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☒ Sample Interval

Water Level ATD _____ ft bgl
Water Level _____ ft bgl
Notes:

WELL SCYI-RFI.GPJ AMAI.GDT 6/19/03

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI  Boring: **BG-6**  Pg. 1 of 1

Drilling Co: PACE  Drilling Method: Direct-push  Date Started: 4/15/03

Location: SCYI  Sampler / Drop: 2-inch macrocore  Date Completed: 4/15/03

Yabucoa, Puerto Rico  Desc. of Meas Pt: Top of PVC Casing  Logged by: N. Rivera

Surface Elev.: _____  Meas. Pt. Elev: _____  Reviewed by: M. Stein

| | BLOWS/6 in. | RECOVERY (in) | PID (ppm) | SAMPLES | DEPTH (ft) | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|---|
| | | 46 | 0.0 | BG-6 0.0-0.5 | | | (0-6") Backfill: gravelly, silty CLAY/silty, clayey GRAVEL, brown, slightly moist, roots. | CL |
| | | | 0.0 | | | | (6-46") silty CLAY, dark brown to brown, slightly moist, hard, Fe concretions. | CL |
| 2 | | | 0.0 | BG-6 1.5-2.0 | 2 | | | |
| | | | 0.0 | BG-6 3.0-3.5 | | | | |
| 4 | | | | | 4 | | Bottom of boring @ 4 feet. | |


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Water Level ATD _____ ft bgl ▽

Water Level _____ ft bgl ▼

Notes:

WELL SCYI-RFI.GPJ AMAI.GDT 6/19/03

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI  Boring: BG-7  Pg. 1 of 1

Drilling Co: PACE  Drilling Method: Direct-push  Date Started: 4/16/03

Location: SCYI  Sampler / Drop: 2-inch macrocore  Date Completed: 4/16/03

Yabucoa, Puerto Rico  Desc. of Meas Pt: Top of PVC Casing  Logged by: N. Rivera

Surface Elev.: _____  Meas. Pt. Elev: _____  Reviewed by: M. Stein

| BLOWS/6 in. | RECOVERY (in) | PID (ppm) | SAMPLES | DEPTH (ft) | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|
| | 46 | 0.0 | BG-7 0.0-0.5 | | | (0-12") Backfill: gravelly, sandy, silty CLAY, light brown, slightly moist, soft to stiff. | CL |
| | | 0.0 | | | | (12-46") sandy, silty CLAY, light brown, gray, black Fe concretions, granodiorite fragments. | CL |
| | | 0.0 | BG-7 1.5-2.0 | 2 | | | |
| | | 0.0 | BG-7 3.0-3.5 | | | | |
| | | | | 4 | | Bottom of boring @ 4 feet. | |

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Water Level ATD _____ ft bgl ▽

Water Level _____ ft bgl ▼

Notes:

WELL_SCYI-RFI.GPJ AMAI.GDT 6/19/03

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI  Boring: BG-8  Pg. 1 of 1

Drilling Co: PACE  Drilling Method: Direct-push  Date Started: 4/16/03

Location: SCYI  Sampler / Drop: 2-inch macrocore  Date Completed: 4/16/03

Yabucoa, Puerto Rico  Desc. of Meas Pt: Top of PVC Casing  Logged by: N. Rivera

Surface Elev.:  Meas. Pt. Elev:  Reviewed by: M. Stein

| BLOWS/6 in. | RECOVERY (in) | PID (ppm) | SAMPLES | DEPTH (ft) | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|
| | 46 | 0.0 | BG-8 0.0-0.5 | | | (0-46") SAND, medium to coarse grained, light yellow, slightly moist, loose, shell, coral, gastropod, granodiorite fragments. | SW |
| | | 0.0 | | | | | |
| | | 0.0 | BG-8 1.5-2.0 | 2 | | | |
| | | 0.0 | BG-8 3.0-3.5 | | | | |
| | | | | 4 | | Bottom of boring @ 4 feet. | |

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☒ Sample Interval

Water Level ATD _____ ft bgl ▽

Water Level _____ ft bgl ▼

Notes:

**Project:** Shell Chemical Yabucoa Inc. - Supplemental RFI  Boring: **BG-9**  Pg. 1 of 1

Drilling Co: PACE
Location: SCYI
Yabucoa, Puerto Rico
Surface Elev.: _____

Drilling Method: Direct-push
Sampler / Drop: 2-inch macrocore
Desc. of Meas Pt: Top of PVC Casing
Meas. Pt. Elev: _____

Date Started: 4/15/03
Date Completed: 4/15/03
Logged by: N. Rivera
Reviewed by: M. Stein

| DEPTH (ft) | BLOWS/6 in. | RECOVERY (in) | PID (ppm) | SAMPLES | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL |
|---|---|---|---|---|---|---|---|
| | | 42 | 0.0 | BG-9 0.0-0.5 | | (0-32") SAND, medium to coarse grained, brown, light yellow, slightly moist, loose. | SW |
| | | | 0.0 | | | | |
| 2 | | | 0.0 | BG-9 1.5-2.0 | 2 | | |
| | | | | | | (32-42") silty CLAY, brown, light yellow, slightly moist, loose. | CL |
| | | | 0.0 | BG-9 3.0-3.5 | | | |
| 4 | | | | | 4 | Bottom of boring @ 4 feet. | |

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Water Level ATD _____ ft bgl ▽
Water Level _____ ft bgl ▼
Notes:

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